REPAIR AND REHAB	ILITATION REQUIRED		Priority				
Element Repair and Rehabilitation Required 6 Approaches Replace end treatments with code compliant end treatment, replace damaged sections of guiderail		6 – 10 Years	1 - 5 Years	< 1 year	Cost		
				X	\$	24,000.00	
Total Cost							

ASSOCIATED WORK	Comments	Estimated Cost
Approaches		
Detours		
Traffic Control		
Utilities		
Right of Way		
Environmental Study		
Other		
Contingencies		
	Total Cost	\$

JUSTIFICATION		



Photo 1 Structure from north approach



Photo 2 Structure from south approach



Photo 3 North approach from centre of structure



Photo 4 South approach from centre of structure



Photo 5 East elevation



Photo 6 West elevation



Photo 7 Wide longitudinal and transverse cracks noted on wearing surface



Photo 8 Damage observed on steel beam at southwest corner



Photo 9 Narrow crack with efflorescence on north deck soffit



Photo 10 Typical deck soffit with previous concrete repairs



Photo 11 Typical northeast wingwall



Photo 12 Typical north abutment wall



Photo 13 Graffiti on south abutment wall

Structure Condition Summary Form

Structure Name Line 3 North Road Bridge

Structure Number 12

Date of InspectionJune 03, 2022Project No.22035

Consultant HP Engineering Inc.

Element Group	Element Name	Unit (Qty.)	Unit Price (MTO)	Total Element Quantity	Element Qty. in Excellent Condition (1.00)	Element Quantity in Good Condition (0.75)	Element Quantity in Fair Condition (0.4)	Element Quantity in Poor Condition (0)	Total Replacement Value (TRV)	Current Element Value (CEV)	Element Condition Index	Performance Deficiency	Maintenance Need
Abutment	Abutment Walls	Sq.m	900.00	95.47	0.00	95.47	0.00	0.00	85923	64442	75	00	00
Approaches	Wearing Surface	Sq.m	6.00	42.90	0.00	25.90	15.00	2.00	257	153	59	00	02, 12
Barriers	Posts - Timber	Each	50.00	22.00	0.00	22.00	0.00	0.00	1100	825	75	00	00
Darriers	Railing Systems	m	200.00	33.00	0.00	32.00	0.50	0.50	6600	4840	73	08	00
Beams / Main	Girders -Steel	Sq.m	420.00	90.63	0.00	90.63	0.00	0.00	38065	28548	75	00	00
	Deck Top - Thin Slab	Sq.m	120.00	138.60	0.00	138.60	0.00	0.00	16632	12474	75	00	00
Decks	Soffit - Thin Slab	Sq.m	120.00	145.20	0.00	145.20	0.00	0.00	17424	13068	75	00	00
	Wearing Surface	Sq.m	25.00	117.98	0.00	111.98	5.00	1.00	2950	2150	73	00	12
Sidewalks/ Curbs	Curbs	Sq.m	40.00	23.10	0.00	23.10	0.00	0.00	924	693	75	00	00
									169875	127193			

Bridge Condition Index (BCI)	75	
l _t	0	Importance Factor for Traffic
I _c	0	Importance Factor for Economic Impacts
l _w	0	Importance Factor for Bridge Width
I _p	0	Importance Factor for Bridge Profile or Alignment
Duides Cufficiens		
Bridge Sufficiency Index (BSI)	75	

INVENTORY DATA	:					
Structure Name	Line 3 North Road Bridge					
		Crossing	Navigable Wa	nter 🗆	Non- Naviga	able Water
Main Hwy/Road #	On Under	□ Type:	Rail 🗆	Road	Ped □	Other \square
Road Name:	Line 3 North Road					
Structure Location	250m North of Highway 17, Lot 17, Con	12 Bonfield Ontario	over Kaibuskonş	g River		
Latitude	46° 16' 19" N	Longitude		79° 8	8' 15" W	
Owner(s)	Township of Bonfield	Heritage	Not Cons.	Cons./Not A	pp. 🗆 List	/Not Desig.
		Designation	Desig./not Lis	st 🗆	Desig. & Lis	st 🗆
MTO Region	Northeastern	Road Class:	Freeway \square	Arterial	Collector	Local
MTO District	Sudbury	Posted Speed		No. of L	anes	1
Old County	Nipissing	AADT		% Truck	ζS	<u>-</u>
Geographic Twp.	Bonfield	Special Routes	s Transit □	Truck	School	Bicycle
Structure Type	Concrete Slab on Steel Girders	D to a Lorent	. 1			
		Detour Length Structure	Around			(km)
Total Deck Length	(m)	Fill on Structur	re			(m)
Overall Str. Width	(m)	Skew Angle				(Degrees)
Total Deck Area	(m ²)	Direction of St	tructure	N	I-S	_
Roadway Width	(m)	No. of Spans		1		(m)
Span Lengths	(m)					
HISTORICAL DATA	4					
Year Built		Last B	iennial Inspectior	n	Aı	ugust 6, 2020
Current Load Limit		_	ridge Master Insp			
Load Limit By-Law#		Last E	valuation			
By-Law Expiry Date		=	nderwater Inspec	etion		
Min. Vertical Clearanc	e	_(m) Last Co	ondition Survey			
Rehabilitation Histor	y: (Date / Description)					

BRIDGE Site No.: 12

FIELD INSPECTION I	FIELD INSPECTION INFORMATION						
Date of Inspection:	June 03, 2022						
Inspector:	shi Dwivedi, P.Eng., HP Engineering						
Others in Party:	Nicholas Brown, HP Engineering						
Equipment Used:	Digital camera, measuring tape, hammer						
Weather:	Overcast						
Temperature:	22 °C						

ADDITIONAL INVESTIGATION REQUIRED		Priority				
		Normal	Urgent	Cost		
Detailed Deck Condition Survey:	X			\$		
Bridge Rehabilitation / Replacement Study:			X	\$ 5,000.00		
Detailed Coating Condition Survey:	X			\$		
Underwater Investigation:	X			\$		
Fatigue Investigation:	X			\$		
Seismic Investigation:	X			\$		
Structural Evaluation:	X			\$		
Load Posting - Estimated Load			Total Cost	\$ 5,000.00		

Rehabilitation / replacement study is for barrier only.

Structure is generally in good condition. Code compliant end treatment should be installed. Adequacy of deck barrier should be verified. Washout noted in approach wearing surface at northeast and northwest corners.

Next Detailed Inspection:	June 2024

Suspected Performance Deficiencies 00 None

Susp	decied i chomianee Beneficies				
00	None	06	Bearing not uniformly loaded/unstable	12	Slippery surfaces
01	Load carrying capacity	07	Jammed expansion joint	13	Flooding/channel blockage
02	Excessive deformations (deflections & rotation)	08	Pedestrian/vehicular hazard	14	Undermining of foundation
03	Continuing settlement	09	Rough riding surface	15	Unstable embankments
04	Continuing movements	10	Surface ponding	16	Other
05	Seized bearings	11	Deck drainage		

Mai	ntenance Needs				
01	Lift and swing bridge maintenance	07	Repair of structural steel	13	Erosion control at bridges
02	Bridge cleaning	08	Repair of bridge concrete	14	Concrete sealing
03	Bridge handrail maintenance	09	Repair of bridge timber	15	Rout and seal
04	Painting steel bridge structures	10	Bailey bridges maintenance	16	Bridge deck drainage
05	Bridge deck joint repair	11	Animal/pest control	17	Scaling (Loose concrete or ACR steel)
06	Bridge bearing maintenance	12	Bridge surface repair`	18	Other

ELEMENT DATA										
Element Group:	Approaches			Length: 10.1			10.1 m			
Element Name:	Barrier			Width:	:	-				
Location:	NE, NW, SE & SW	of Structure		Height: -			-			
Material:	Steel and Timber			Count:		2				
Element Type:	Steel Flex Beam or	Timber Posts		Total (Quantity:	20.2	m			
Environment:	Severe			Not Ins	spected:					
Protection System	None						Performance	Maintenance		
Units	Excellent	Good	Fair		Poor		Deficiencies	Needs		
m	-	6.2	10		4		08	-		
	lex beam. Buried end	se spacers observed on ap treatments are not code c								
None		1 − 5 years		< 1 5	year		Urgent			
Element Group:	Approaches			Length	1:	6 m				
Element Name:	Wearing Surface			Width:	•	7.15	m			
Location:	North & South of S	Structure		Height: -						
Material:	Gravel			Count: 2						
Element Type:	Wearing Surface			Total Quantity: 42.9 m ²						
Environment:	Severe			Not Inspected:						
Protection System	None			Performance Maintenance						
Units	Excellent	Good	Fair		Poor		Deficiencies	Needs		
m²	-	25.9	15		2		-	02, 12		
		n with tire rutting on sour				ımulati	on noted on the deck.	Washout noted at		
None I	meast and normitteet	$1-5$ years \Box	ea m wearing se		year		Urgent			
Element Group:	Accessories			Length	1:	-				
Element Name:	Hazard Signs, Narr	ow Lane Signs		Width:	<u> </u>	-				
Location:	NE, NW, SE & SW	of Structure		Height	:	-				
Material:	Steel			Count:	1	6				
Element Type:	Steel Hazard Signs	, Narrow Lane Signs		Total (Quantity:	6				
Environment:	Severe			Not Ins	spected:					
Protection System	Hot Dip Galvanizii	ng					Performance	Maintenance		
Units	Excellent	Good	Fair		Poor		Deficiencies	Needs		
each	-	5	1		-		-	-		
Comments: Ge	nerally in good condit	ion with some abrasions i	noted on signs. N	ortheast !	hazardous sign is l	eaning				
None		1 − 5 years □		< 1 x	year \sqcap		Urgent □			

ELEMENT DATA									
Element Group:	Barrier			Length	:	16.5	m		
Element Name:	Railing System			Width:		-			
Location:	East & West Sides	of Structure		Height	:	-	-		
Material:	Steel			Count:		2	2		
Element Type:	Steel Flex Beam or	n Wood Posts		Total (Quantity:	33 m			
Environment:	Severe			Not Ins	spected:				
Protection System	None						Performance	Maintenance Needs	
Units	Excellent	Good	Fair		Poor		Deficiencies		
m	-	32	0.5		0.5		08	-	
	icle damage observed quacy of deck barrier	l on barrier at southeast a	nd northwest cor	mers of d	eck. Multiple rotat	ed and	loose spacers on deck	barrier.	
None □	quacy of deck barrier	1 − 5 years		< 1	year =		Urgent □		
				i	·				
Element Group:	Barriers			Length	:	-			
Element Name:	Posts			Width:		-			
Location:	East & West Sides	East & West Sides of Structure				-			
Material:	Timber		Count:		22				
Element Type:	Timber Posts			Total (Quantity:	22			
Environment:	Severe			Not Ins	spected:				
Protection System	None						Performance	Maintenance	
Units	Excellent	Good	Fair		Poor		Deficiencies	Needs	
each	-	22	-	-			-	-	
Comments: Many rotate	ed spacers observed o	n deck barrier. Checks an	d splits observed	l in timbe	er posts. Posts are	genera	lly in good condition.		
None		1 − 5 years		< 1 year ☐ Urgent ☐					
Element Group:	Sidewalks/Curbs			Length	:	16.5	m		
Element Name:	Curbs			Width:		0.6 n	1		
Location:	East & West Sides	of Structure		Height	:	0.1 n	1		
Material:	Concrete			Count:		2			
Element Type:	Concrete Curb			Total (Quantity:	23.1	m²		
Environment:	Severe				spected:				
Protection System	None							Maintenance	
Units	Excellent	Good	Fair		Poor		Performance Deficiencies	Maintenance Needs	
m²	-	23.1	-		-		-	-	
Comments: Na	arrow cracks observed	l on horizontal face and v	rertical face of cu	ırb. Smal	l spall noted at sou	ıtheast	corner.		
None		1 – 5 vears □		< 1 x	vear □		∐rgent □		

ELEMENT DATA								
Element Group:	Deck			Length	:	16.5	m	
Element Name:	Wearing Surface			Width:		7.15	m	
Location:	Top of Deck			Height	:			
Material:	Asphalt			Count:		1		
Element Type:	Asphalt Wearing S	urface		Total (Quantity:	117.9	98 m²	
Environment:	Severe			Not Ins	spected:			
Protection System	None						Performance	Maintenance
Units	Excellent	Good	Fair		Poor		Deficiencies	Needs
m²	-	111.98	5.0		1		-	12
Comments: Gen	erally in good conditi	ion with minor scaling and	d some small go	uges in th	ne middle of roadw	vay. Sm	nall potholes observed	on the deck.
None		1 − 5 years		< 1 y	year 🔲		Urgent	
Element Group:	Decks			Length	ı:	16.5	m	
Element Name:	Deck Top (Covered	(t)		Width:	<u> </u>	8.4 n	1	
Location:	Top of Deck	<u></u>		Height	:	-		
Material:	Concrete			Count:		138.6	5 m ²	
Element Type:	Thick Slab			Total (Quantity:	m ²		
Environment:	Moderate			Not Ins	spected:			
Protection System	None						Performance	Maintenance
Units	Excellent	Good	Fair	Poor		Deficiencies		Needs
m²	-	138.6	-		-	-		-
Comments: Dec.	k top not visible due	to asphalt wearing surface	e; rating is based	on condi	ition of deck weari	ing surf	face and soffit.	
None		1 − 5 years		< 1 y	year 🔲		Urgent	
Element Group:	Decks			Length	ı:	16.5	m	
Element Name:	Soffit - Thin Slab ((Exterior)		Width:		0.8 m		
Location:	East & West Under			Height		0.5 n		
Material:	Concrete			Count:		2		
Element Type:	Cast-In-Place Conc		Total (Quantity:	42.9	42.9 m ²		
Environment:	Moderate			Not Ins	spected:			
Protection System	None						Performance	Maintenance
Units	Excellent	Good	Fair		Poor		Deficiencies	Needs
m²	-	42.9	-	-			-	-
		ion with damp stains, narr	row transverse c	racks and	map cracks. Efflo	orescen	ce and narrow longitud	dinal cracks with
dam None. ■	p stains noted on fasc	cias. 1 – 5 vears □		< 1.	vear \square		∐røent □	

Decks			Length	:	16.5	16.5 m		
Soffit - Thin Slab (Interior)		Width:		6.2 m	6.2 m		
Underside of Deck			Height	1	-			
Concrete			Count:		1			
Thick Slab			Total (Quantity:	102.3	3 m ²		
Benign			Not Ins	spected:				
None						Performance	Maintenance	
Excellent	Good	Fair		Poor		Deficiencies	Needs	
-	102.3	-		-		-	-	
good condition with	damp stains, narrow tran	sverse and map	cracks					
	1 – 5 years □		< 1 y	year □		Urgent 🖂		
Beams/MLE's			Length	:	15.9	m		
Girders			Width:		0.20	m		
Underside of Struct	ure				0.65	5 m		
Weathering Steel					3			
Steel I Girders			Total (Quantity:	90.63	3 m ²		
Moderate			Not Ins	spected:				
None						Performance	Maintenance	
Excellent	Good	Fair		Poor		Deficiencies	Needs	
-	90.63	-		-		-	-	
ers are in good condi	tion with some localized	light corrosion o	bserved.					
	1 − 5 years □		< l vear □ Urgent □					
Beams/MLE's			Length	:	2.1 m	1		
	ture							
Weathering Steel								
Diaphragm			Total (Quantity:	6			
				spected:	П			
None			I			Performance	Maintenance	
Excellent	Good	Fair		Poor		Deficiencies	Needs	
-	6	-	-			-	-	
ohragms are in good c	condition with some local	lized light corros	ion.				ı	
	Soffit - Thin Slab () Underside of Deck Concrete Thick Slab Benign None Excellent - good condition with Beams/MLE's Girders Underside of Struct Weathering Steel Steel I Girders Moderate None Excellent - ers are in good condition Beams/MLE's Diaphragms Underside of Struct Weathering Steel Steel I Girders Moderate None Excellent - ers are in good condition Beams/MLE's Diaphragms Underside of Struct Weathering Steel Diaphragm Moderate None Excellent - None Excellent - Excellent -	Soffit - Thin Slab (Interior) Underside of Deck Concrete Thick Slab Benign None Excellent Good - 102.3 good condition with damp stains, narrow transport of the state of Structure Weathering Steel Steel I Girders Moderate None Excellent Good - 90.63 ers are in good condition with some localized of Structure Weathering Steel Steel I Girders Moderate None Excellent Jeros Good - 90.63 All Syears Good I - 5 years Good I - 5 years Good I - 6 Good And	Soffit - Thin Slab (Interior) Underside of Deck Concrete Thick Slab Benign None Excellent Good Fair - 102.3 good condition with damp stains, narrow transverse and map and a stain sta	Soffit - Thin Slab (Interior) Width: Underside of Deck Height Concrete Count: Thick Slab Total Count: Benign Not Instituted None Fair Excellent Good Fair - 102.3 - good condition with damp stains, narrow transverse and map cracks 1 - 5 years < 1 years Beams/MLE's Length Girders Width: Width: Underside of Structure Height Weathering Steel Count: Not Institute None Not Institute Not Institute Excellent Good Fair - 90.63 - ers are in good condition with some localized light corrosion observed. 1 - 5 years Beams/MLE's Length Diaphragms Width: Underside of Structure Height Weathering Steel Count: Diaphragm Total Count: Diaphragm Not Institute <	Soffit - Thin Slab (Interior) Width: Underside of Deck Count: Thick Slab Total Quantity: Benign Not Inspected: None Excellent Good Fair Poor - 102.3 - - good condition with damp stains, narrow transverse and map cracks Beams/MLE's Length: Girders Width: Underside of Structure Height: Not Inspected: Secult of Good Fair Poor - Spears Spears	Soffit - Thin Slab (Interior) Width:	Sofit - Thin Slah (Interior) Width: 6.2 m. Underside of Deck Ileigh:	

ELEMENT DATA								
Element Group:	Abutments			Length	ı:	0.9 n	n	
Element Name:	Abutment Walls			Width:	:	8.05 m		
Location:	North & South Und	lerside of Structure		Height	:	5.93	m	
Material:	Concrete			Count:		2		
Element Type:	Cast-in-Place Conc	rete		Total (Quantity:	95.47	7 m ²	
Environment:	Benign			Not Ins	spected:			
Protection System	None						Performance	Maintenance
Units	Excellent	Good	Fair		Poor		Deficiencies	Needs
m ²	-	95.47	-		-		-	-
Comments: Visible port		od condition with narrow	transverse crack	s and dar	mp stains. Rust sta	ins orig	ginating from girders o	n north abutment
None ■		1 – 5 years □		< 1 y	year 🔲		Urgent □	
Element Group:	Abutments			Length	ı:	1.5 n	n	
Element Name:	Wingwalls			Width:	:	-		
Location:	NE, NW, SW & SV	V of Structure		Height: 5.25		5.25	5.25 m	
Material:	Concrete			Count:		4		
Element Type:	Cast-in-Place Conc	rete		Total (Quantity:	31.5	m^2	
Environment:	Benign			Not Ins	spected:			
Protection System	None			•			Performance	Maintenance
Units	Excellent	Good	Fair		Poor		Deficiencies	Needs
m ²	-	31.5	-		-		-	-
Comments: Gen	erally in good condit	ion with narrow horizonta	al cracks.					
None		1 – 5 years □		< 1 y	year 🔲		Urgent	
	ı			I				
Element Group:	Foundations			Length	ı:	-		
Element Name:	Foundations (below	ground level)		Width:	:	-		
Location:	Below Abutments			Height	:	-		
Material:	Unknown			Count:		-		
Element Type:	Unknown			Total (Quantity:	-		
Environment:	Benign			Not Ins	spected:			
Protection System	Unknown						Performance	Maintenance
Units	Excellent	Good	Fair		Poor		Deficiencies	Needs
N/A	-	-	-	-			-	-
Comments: No	visible evidence of fo	undation instability at tim	e of inspection.					
None		1 − 5 years		< 1 y	year 🔲	_	Urgent	

ELEMENT DATA								
Element Group:	Embankment and S	treams		Length	1:	-		
Element Name:	Embankments			Width	1	-		
Location:	NE, NW, N, SE, S	W & S of Structure		Height	:	-		
Material:	Native			Count:		6		
Element Type:	Embankment			Total (Quantity:	6		
Environment:	Benign			Not Ins	spected:			
Protection System	Rock Protection						Performance	Maintenance Needs
Units	Excellent	Good	Fair		Poor		Deficiencies	
each	-	6	-		-		-	-
Comments: Moo	derately sloped, no ve	getation and stable with r	ocks for slope p	rotection.	Drainage pipes n	oted at	embankments.	
None		1 − 5 years		< 1	year 🗌		Urgent	
Element Group:	Embankment and S	treams		Length	1:	-		
Element Name:	Slope Protection			Width:	1	-		
Location:	NE, NW, N, SE, S	NE, NW, N, SE, SW & S of Structure				-		
Material:	Rocks	Rocks				6		
Element Type:	Rock Slope Protect	ion		Total (Quantity:	6		
Environment:	Benign			Not Ins	spected:			
Protection System	None						Performance	Maintenance
Units	Excellent	Good	Fair	Poor			Deficiencies	Needs
each	-	6	-	-			-	-
Comments: Roc	k protection is in goo	d condition.						
None		1 − 5 years		< 1 year Urgent Urgent				
Element Group:	Embankment and S	treams		Length	:	-		
Element Name:	Streams and Water	ways		Width	!	-		
Location:	Below Structure			Height		-		
Material:	Native			Count:		-		
Element Type:	Stream				Quantity:	All		
Environment:	Benign			Not Ins	spected:			
Protection System	None						Performance Deficiencies	Maintenance Needs
Units	Excellent	Good	Fair		Poor			Needs
each	-	All	-	-			-	-
Comments: Mod	derate volume and mo	derate flow from west to	east with no vis	ible flow	obstructions.			
None		1 − 5 years		< 1	year		Urgent	

REPAIR AND REHAE	REPAIR AND REHABILITATION REQUIRED				E	stimated
Element	Repair and Rehabilitation Required	6 - 10 Years	1 - 5 Years	< 1 year	Cost	
Approaches	Install Code Compliant End Treatment			X	\$	24,000.00
				Total Cost	s	24,000.00

ASSOCIATED WORK	Comments	Estimated Cost
Approaches		
Detours		
Traffic Control		
Utilities		
Right of Way		
Environmental Study		
Other		
Contingencies		
	Total Cost	\$

JUSTIFICATION		



Photo 1 Structure from north approach



Photo 2 Structure from south approach



Photo 3 North approach from centre of structure



Photo 4 South approach from centre of structure



Photo 5 East elevation



Photo 6 West elevation



Photo 7 Collision damage noted on approach barrier at northeast corner



Photo 8 Checks and splits on barrier post with damaged and rotated spacer block



Photo 9 Vehicle damaged noted on deck barrier at southeast corner



Photo 10 Washout noted in wearing surface at north approach



Photo 11 Minor scaling and small gouges noted in middle of deck wearing surface



Photo 12 Small spall noted in curb at southeast corner



Photo 13 North underside of structure



Photo 14 Typical northwest wingwall



Photo 15 North abutment wall



Photo 16 South abutment wall

ATTACHMENT 2

OSIM INSPECTION REPORTS & BCI FORMS

CULVERTS

Structure Condition Summary Form

Structure Name Grand Desert Road Culvert

Structure Number 03

Date of InspectionJune 03, 2022Project No.22035

Consultant HP Engineering Inc.

Element Group	Element Name	Unit (Qty.)	Unit Price (MTO)	Total Element Quantity	Element Qty. in Excellent Condition (1.00)	Good	Fair	Element Quantity in Poor Condition (0)	Total Replacement Value (TRV)	Current Element Value (CEV)	Element Condition Index	Performance Deficiency	Maintenance Need
Approaches	Wearing Surface	Sq.m	6.00	303.00	0.00	253.00	50.00	0.00	1818	1259	69	00	00
Culvert	Barrel	Sq.m	350.00	96.63	0.00	94.63	2.00	0.00	33821	25120	74	00	00
Retaining Walls	Walls	Sq.m	350.00	12.00	0.00	12.00	0.00	0.00	4200	3150	75	00	00
									39839	29529			

Bridge Condition Index (BCI)	74	
l _t	0	Importance Factor for Traffic
I _c	0	Importance Factor for Economic Impacts
I _w	0	Importance Factor for Bridge Width
I _p	0	Importance Factor for Bridge Profile or Alignment
Bridge Sufficiency Index (BSI)	74	

Main Hovy/Road #	INVENTORY DATA:							
Nain Hwy/Road # Creek 28 km south of Boxwell road, Lot 23, Cors 3 bonfield Creek 28 km south of Boxwell road, Lot 23, Cors 3 bonfield Creek 28 km south of Boxwell road, Lot 23, Cors 3 bonfield Creek 28 km south of Boxwell road, Lot 23, Cors 3 bonfield Creek 28 km south of Boxwell road, Lot 23, Cors 3 bonfield Creek 28 km south of Boxwell road, Lot 23, Cors 3 bonfield Creek 28 km south of Boxwell road, Lot 23, Cors 3 bonfield Creek 28 km south of Boxwell road, Lot 23, Cors 3 bonfield Creek 28 km south of Boxwell road, Lot 23, Cors 3 bonfield Creek 28 km south of Boxwell road, Lot 23, Cors 3 bonfield Creek 28 km south of Boxwell road, Lot 23, Cors 3 bonfield Creek 28 km south of Boxwell road, Lot 23, Cors 3 bonfield Creek 28 km south of Boxwell road, Lot 23, Cors 3 bonfield Creek 28 km south of Boxwell road, Lot 23, Cors 3 bonfield Creek 28 km south of Boxwell road, Lot 23, Cors 3 bonfield Creek 28 km south of Boxwell road, Lot 24, Cors 3 bonfield Creek 28 km south of Boxwell road, Lot 24, Cors 3 bonfield Creek 28 km south of Boxwell road, Lot 24, Cors 3 bonfield Creek 28 km south of Boxwell road, Lot 24, Cors 3 bonfield Creek 28 km south of Boxwell road, Lot 24, Cors 3 bonfield Creek 28 km south of Boxwell road, Lot 24, Cors 3 bonfield Creek 28 km south of Boxwell road, Lot 24, Cors 3 bonfield Creek 28 km south of Boxwell road, Lot 24, Cors 3 bonfield Creek 28 km south of Boxwell road, Lot 24, Cors 3 bonfield Creek 28 km south of Boxwell road, Lot 24, Cors 3 bonfield Creek 28 km south of Boxwell road, Lot 24, Cors 3 bonfield Creek 28 km south of Boxwell road, Lot 24, Cors 3 bonfield Creek 28 km south of Boxwell road, Lot 24, Cors 3 bonfield Creek 28 km south of Boxwell road, Lot 24, Cors 3 bonfield Creek 28 km south of Boxwell road, Lot 24, Cors 3 bonfield Creek 28 km south of Boxwell road, Lot 24, Cors 3 bonfield Creek 28 km south of Boxwell road, Lot 24, Cors 3 bonfield Creek 28 km south of Boxwell road, Lot 24, Cors 3 bonfield Creek 28 km s			lvert					
Road Name: Grand Desert Road Fed Other Other Other				Crossing	Navigable Wat	ter 🗆	Non- Navigal	ole Water
Creek 2.8 km south of Boxwell road 1.00 Longitude Longitude	Main Hwy/Road #	C	On ■ Under □	Type:	Rail 🗆	Road	Ped □	Other \square
Latitude	Road Name:	Grand Desert Road						
Not Cons Not Northeaster Not Cons Not Cons Not	Structure Location	Creek 2.8 km south of	Boxwell road , Lot 23	3, Con 3 Bonfield	Ontario over Sha	arpes		
MTO Region Northeastem Road Class: Freeway Arterial Collector Local ■	Latitude	46° 12' 15	8.7" N	Longitude		79° <u>3</u>	3' 34.6" W	
MTO District	Owner(s)	Township of Bonfield						
Mipissing MADT Mipissing Mapissing	MTO Region	Northeastern		Road Class:	Freeway	Arterial	Collector	Local
Secographic Twp. Bonfield Special Routes Transit Truck School Bicycle	MTO District	Sudbury		Posted Speed	40 km/h	No. of I	anes	1
Structure Type Concrete Culvert Detour Length Around Structure (km) Total Deck Length 9.28 (m) Fill on Structure (m) Overall Str. Width 5.52 (m) Skew Angle 0 (Degrees) Total Deck Area 51.23 (m²) Direction of Structure E-W	Old County	Nipissing		AADT		% Trucl	κs	
Detour Length Around Structure	Geographic Twp.	Bonfield		Special Routes	Transit \square	Truck \square	School \square	Bicycle \square
Overall Str. Width 5.52 (m) Skew Angle 0 (Degrees) Total Deck Area 51.23 (m²) Direction of Structure E-W Roadway Width 4.75 (m) No. of Spans 1 (m) Span Lengths 9.28 (m) Last Biennial Inspection August 7, 2020 HISTORICAL DATA Year Built 2009 Last Biennial Inspection August 7, 2020 Current Load Limit Load Limit Load Limit By-Law # Last Evaluation Last Evaluation By-Law Expiry Date Last Underwater Inspection Last Underwater Inspection Min. Vertical Clearance (m) Last Condition Survey ————————————————————————————————————	Structure Type	Concrete Culvert			Around			_(km)
Total Deck Area 51.23 (m²) Direction of Structure E-W Roadway Width 4.75 (m) No. of Spans 1 (m) Span Lengths 9.28 (m) Last Bridge Master Inspection August 7, 2020 Current Load Limit (tonnes) Last Bridge Master Inspection August 7, 2020 Load Limit By-Law # Last Evaluation Last Underwater Inspection By-Law Expiry Date Last Underwater Inspection Min. Vertical Clearance (m) Last Condition Survey	Total Deck Length	9.28	(m)	Fill on Structure	e			_(m)
Roadway Width 4.75 (m) No. of Spans 1 (m) Span Lengths 9.28 (m) HISTORICAL DATA Year Built 2009 Last Biennial Inspection August 7, 2020 Current Load Limit Load Limit By-Law # Last Evaluation By-Law Expiry Date Last Underwater Inspection Min. Vertical Clearance (m) Last Condition Survey Rehabilitation History: (Date / Description)	Overall Str. Width	5.52	(m)	Skew Angle			0	_(Degrees)
Span Lengths 9.28 (m) HISTORICAL DATA Year Built Current Load Limit Load Limit By-Law # Last Bridge Master Inspection Last Evaluation Last Underwater Inspection Min. Vertical Clearance (m) Last Condition Survey Rehabilitation History: (Date / Description)	Total Deck Area	51.23	(m ²)	Direction of Str	ructure	E	-W	_
HISTORICAL DATA Year Built 2009 Last Biennial Inspection August 7, 2020 Current Load Limit (tonnes) Last Bridge Master Inspection Load Limit By-Law # Last Evaluation By-Law Expiry Date Last Underwater Inspection Min. Vertical Clearance (m) Last Condition Survey Rehabilitation History: (Date / Description)	Roadway Width	4.75	(m)	No. of Spans			1	_(m)
Year Built 2009 Last Biennial Inspection August 7, 2020 Current Load Limit (tonnes) Last Bridge Master Inspection Load Limit By-Law # Last Evaluation By-Law Expiry Date Last Underwater Inspection Min. Vertical Clearance (m) Last Condition Survey Rehabilitation History: (Date / Description)	Span Lengths	9.28	(m)					
Year Built 2009 Last Biennial Inspection August 7, 2020 Current Load Limit (tonnes) Last Bridge Master Inspection Load Limit By-Law # Last Evaluation By-Law Expiry Date Last Underwater Inspection Min. Vertical Clearance (m) Last Condition Survey Rehabilitation History: (Date / Description)	HISTORICAL DATA							
Current Load Limit (tonnes) Last Bridge Master Inspection Load Limit By-Law # Last Evaluation By-Law Expiry Date Last Underwater Inspection Min. Vertical Clearance (m) Last Condition Survey Rehabilitation History: (Date / Description)			2009	Last Bi	ennial Inspection	1	Au	gust 7, 2020
By-Law Expiry Date Last Underwater Inspection Min. Vertical Clearance (m) Last Condition Survey Rehabilitation History: (Date / Description)					•			
Min. Vertical Clearance (m) Last Condition Survey Rehabilitation History: (Date / Description)	Load Limit By-Law#			Last Ev	aluation			
Rehabilitation History: (Date / Description)				·				
• • •	Min. Vertical Clearance	; 	(m)	Last Co	ondition Survey			
- Structure replaced in 2009	Rehabilitation History	: (Date / Description)						
	- Structure replaced in 2	2009						

CULVERT Site No.: 03

FIELD INSPECTION	FIELD INSPECTION INFORMATION				
Date of Inspection:	June 03, 2022				
Inspector:	Tashi Dwivedi, P. Eng., HP Engineering				
Others in Party:	Nicholas Brown, HP Engineering				
Equipment Used:	Digital camera, measuring tape, hammer				
Weather:	Sunny				
Temperature:	_16 °C				

ADDITIONAL INVESTIGATION REQUIRED		Priority				
ADDITIONAL INVESTIGATION REQUIRED	None	Normal	Urgent	Cost		
Detailed Deck Condition Survey:	X			\$		
Bridge Rehabilitation / Replacement Study:		X		\$ 5,000.00		
Detailed Coating Condition Survey:	X			\$		
Underwater Investigation:	X			\$		
Fatigue Investigation:	X			\$		
Seismic Investigation:	X			\$		
Structural Evaluation:	X			\$		
Load Posting - Estimated Load			Total Cost	\$ 5,000.00		

Special Notes:

Rehabilitation / replacement study is for barrier only.

Approach barrier end treatments are substandard and should be replaced with code compliant end treatments. Some medium potholes and longitudinal grooves on the east approach. Some localized map cracks were observed on the north and south ends of the barrel. Bug holes observed in barrel.

Next Detailed Inspection:	June 2024

00	None	06	Bearing not uniformly loaded/unstable	12	Slippery surfaces
01	Load carrying capacity	07	Jammed expansion joint	13	Flooding/channel blockage
02	Excessive deformations (deflections & rotation)	08	Pedestrian/vehicular hazard	14	Undermining of foundation
03	Continuing settlement	09	Rough riding surface	15	Unstable embankments
04	Continuing movements	10	Surface ponding	16	Other
05	Seized bearings	11	Deck drainage		

Maintenance Needs

01	Lift and swing bridge maintenance	07	Repair of structural steel	13	Erosion control at bridges
02	Bridge cleaning	08	Repair of bridge concrete	14	Concrete sealing
03	Bridge handrail maintenance	09	Repair of bridge timber	15	Rout and seal
04	Painting steel bridge structures	10	Bailey bridges maintenance	16	Bridge deck drainage
05	Bridge deck joint repair	11	Animal/pest control	17	Other
06	Bridge bearing maintenance	12	Bridge surface repair		

ELEMENT DATA	,								
Element Group:	Approaches			Length	:	27 m	1		
Element Name:	Barrier			Width:		-			
Location:	NE, NW, SE, & SV	W of Structure		Height:	:	-			
Material:	Steel			Count:		4			
Element Type:	Steel Flex Beam or	1 Wood Posts		Total Q	Quantity:	108 m			
Environment:	Severe			Not Ins	pected:				
Protection System	None						Performance	Maintenance	
Units	Excellent	Good	Fair		Poor		Deficiencies	Needs	
m	-	108	-		-		08	18- Fix Wood spots	
		ion with few checks and s							
with code compliant end treatments. Rotated spacer blocks noted on barriers. Impact noted at southwest end. None □ 1 − 5 years □ < 1 year ■ Urgent □									
				- ,			*-D		
El t Carama	Aabaq			Langth		20 m			
Element Name:	Approaches			Length		30 m			
Element Name:	Wearing Surface			Width:		4.75	./3 m		
Location:	East & West of Str		Height:						
Material:	Gravel/ Asphalt			Count:		2	2		
Element Type:	Wearing Surface				Quantity:	285 1	<u>n²</u>		
Environment:	Severe			Not Ins	pected:				
Protection System	None	Г	T ,			Performance Mainten Deficiencies Need			
Units	Excellent	Good	Fair		Poor				
m²	-	235	50		0		00	00	
Comments: Gen	erally in good to fair	condition with some med	fium potholes an	d longitud	linal grooves on th	ie east	approach.		
None		1 − 5 years		< 1 y	ear 🗆		Urgent 🗆		
Element Group:	Signs			Length	:	-			
Element Name:	Signs			Width:		-			
Location:	NE, NW, SE & SW	v of Structure		Height:		-			
Material:	Steel			Count:		7			
Element Type:	Narrow Road Signs	s & hazard signs		Total Q	Quantity:	7			
Environment:	Severe			Not Ins	pected:				
Protection System	Hot-Dip Galvanize	d				<u> </u>	Performance	Maintenance	
Units	Excellent	Good	Fair		Poor		Deficiencies	Needs	
Each	-	6	1		-		-	-	
		approaches is in good cor	ndition. Hazard s	ign at we	st is deformed. No	rtheast	hazard sign is damage	ed. A 2 nd narrow	
road None ■	sign is present furthe	er on the east approach $1-5$ years		< 1 y	⁄ear □		Urgent □		
INOTIC		1 – 5 years		- 1 y	cai _		Olgent [

Element Group:	Culvert	Culvert			:	9.28 m			
Element Name:	Barrel			Width:		5.52	5.52 m		
Location:	Below roadway			Height	:	2.17	m		
Material:	Concrete			Count:		1			
Element Type:	Cast-In-Place Cond	oncrete Total Quantity:			tal Quantity: 96.63m ²				
Environment:	Moderate			Not Ins					
Protection System	None				·		Performance	Maintenance	
Units	Excellent	Good	Fair		Poor		Deficiencies	Needs	
m ²	-	94.63	2		-		-	-	
	nerally in good conditions observed in barrel.	on with some small spall	s. Some localize	d map cra	acks were observe	d on the	e north and south ends	of the barrel. Bug	
None	es observed in barrer.	1 − 5 years		< 1	year 🗆		Urgent □		
Element Group:	Foundations			Length	:	-			
Element Name:	Foundations (below	v ground level)		Width:	:	-			
Location:	Below Structure	, ,			<u> </u>	-			
Material:	Unknown			Count: -					
Element Type:	Unknown	Unknown			Total Quantity: -				
Environment:	Benign			Not Ins	spected:				
Protection System	Unknown						Performance	Maintenance	
Units	Excellent	Good	Fair		Poor		Deficiencies	Needs	
N/A	-	-	-		-		-	-	
Comments: No	evidence of foundation	n instability noted at the	time of inspection	on.					
None		1 − 5 years		< 1	year 🔲		Urgent		
Element Group:	Retaining walls			Length	:	3 m			
Element Name:	Walls			Width:		-			
Location:	NE, NW, SE, & SV	V of Structure		Height	:	-			
Material:	Stones			Count:		4			
Element Type:	Gabion Baskets			Total (Quantity:	12 m			
Environment:	Benign			Not Ins	spected:				
Protection System	None						Performance	Maintenance	
Units	Excellent	Good	Fair		Poor		Deficiencies	Needs	
m	-	12	-		-		-	-	
Comments: Gab	pion baskets are in goo	od condition.							
None		1 − 5 years		< 1 <u>y</u>	year 🗌		Urgent		

Element Group:	Embankment and S	Streams		Length	:	-		
Element Name:	Embankments			Width:		-		
Location:	NE, NW, SE, & SV	W of Structure		Height	:	-		
Material:	Native			Count:		4		
Element Type:	Embankment			Total (Quantity:	4		
Environment:	Benign			Not Ins	spected:			
Protection System	Rock Protection						Performance	Maintenance
Units	Excellent	Good	Fair		Poor		Deficiencies	Needs
Each	-	4	-		-		-	-
Comments: Mo	derately sloped and ap	opear stable with rock slop	pe protection.					
None		1 − 5 years		< 1 y	year 🗌		Urgent	
Element Group:	Embankment and S	Embankment and Streams			:	-		
Element Name:	Slope Protection			Width:	:	-		
Location:	NE, NW, SE, & SV	W of Structure		Height	:	-		
Material:	Rocks			Count:		4		
Element Type:	Slope Protection			Total (Quantity: 4			
Environment:	Benign			Not Ins	spected:			
Protection System	None			Performance			Performance	Maintenance
Units	Excellent	Good	Fair		Poor		Deficiencies	Needs
Each	_	4	-		-		-	-
Comments: Ger	nerally in good conditi	ion.						
None •		1 – 5 years □		< 1 y	year 🔲		Urgent \square	
_				-			<u> </u>	
Element Group:	Embankment and S	Straams		Length	.•	_		
Element Name:	Streams and Water			Width:		-		
Location:	Below Structure	ways		Height		-		
Material:	Native			Count:		-		
Element Type:	Stream				Quantity:	all		
Environment:	Benign				spected:			
Protection System	None						Doufoumanaa	Maintenance
Units	Excellent	Good	Fair		Poor		Performance Deficiencies	Niaintenance Needs
All	-	all	-		-		-	-
Comments: Mo	derate volume and lov	w flow from south to north	h with no visible	obstructi	ions noted in the s	tream a	t the time of inspection	1.
None		1 − 5 years			year 🔲		Urgent \square	

REPAIR AND REHA	REPAIR AND REHABILITATION REQUIRED Priority				F	Estimated	
Element	Repair and Rehabilitation Required	6 - 10 Years	1 - 5 Years	< 1 year		Cost	
Approaches	Install code compliant end treatments			X	\$	24,000.00	
Total Cost							

ASSOCIATED WORK	Comments	Estimated Cost
Approaches		
Detours		
Traffic Control		
Utilities		
Right of Way		
Environmental Study		
Other		
Contingencies		
	Total Cost	S

JUSTIFICATION		

CULVERT SITE PHOTOGRAPHS Site No.: 03



Photo 1 Structure from east approach



Photo 2 Structure from west approach

CULVERT SITE PHOTOGRAPHS Site No.: 03



Photo 3 East approach from centre of structure



Photo 4 West approach from centre of structure

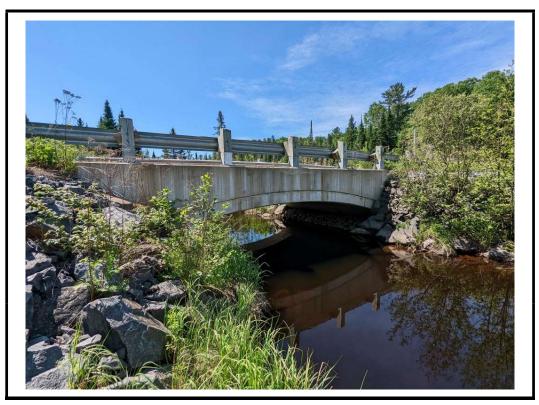


Photo 5 North elevation



Photo 6 South elevation



Photo 7 Tire rutting and loose gravel on east approach.



Photo 8 Longitudinal grooves on structure wearing surface



Photo 9 Stained map cracks noted on exterior face of soffit



Photo 10 Narrow transverse crack noted in centre of soffit at south end



Photo 11 Typical view gabion basket wall and slope protection at southwest corner



Photo 12 Bug holes noted throughout barrel soffit

Structure Condition Summary Form

Structure Name Grand Desert Road Culvert

Structure Number 04

Date of Inspection June 03, 2022

Project No. 22035

Consultant HP Engineering Inc.

Element Group	Element Name	Unit (Qty.)	Unit Price (MTO)	Total Element Quantity	Excellent	Good	Fair	Element Quantity in Poor Condition (0)	Total Replacement Value (TRV)	Current Element Value (CEV)	Element Condition Index	Performance Deficiency	Maintenance Need
Approaches	Wearing Surface	Sq.m	6.00	468.00	0.00	438.00	20.00	10.00	2808	2019	72	09	13
	Barrel	Sq.m	350.00	258.24	0.00	0.00	129.12	129.12	90384	18077	20	01	00
Culvert	Inlet Components	Sq.m	350.00	4.00	0.00	4.00	0.00	0.00	1400	1050	75	00	00
	Outlet Components	Sq.m	350.00	4.00	0.00	4.00	0.00	0.00	1400	1050	75	00	00
									95992	22196			

Bridge Condition Index (BCI)	23	
I _t	0	Importance Factor for Traffic
I _c	0	Importance Factor for Economic Impacts
I _w	0	Importance Factor for Bridge Width
Ip	0	Importance Factor for Bridge Profile or Alignment
Bridge Sufficiency Index (BSI)	23	

INVENTORY DATA	:					
Structure Name	Grand Desert Road Culvert					
		Crossing	Navigable Wa	ter 🗆	Non- Navigal	ble Water
Main Hwy/Road #	On Under	Type:	Rail 🗆	Road	Ped □	Other \square
Road Name:	Grand Desert Road					
Structure Location	1.9 km west of boundary road , Lot 26, C	Con 2 Bonfield Ontari	o over Sharpes C	reek		
Latitude	46° 12' 31.5" N	Longitude		79° 2'	33.6" W	
Owner(s)	Township of Bonfield		Not Cons.	Cons./Not Ap	op. 🗆 List/	Not Desig.
		Designation	Desig./not List	: 🗆	Desig. & List	t 🗆
MTO Region	Northeastern	Road Class:	Freeway	Arterial	Collector	Local
MTO District	Sudbury	Posted Speed	40 km/h	No. of L	anes	2
Old County	Nipissing	AADT		% Truck	s	
Geographic Twp.	Bonfield	Special Routes	Transit \square	Truck \square	School \square	Bicycle \square
Structure Type	Circular CSP	Detour Length	Around			
		Structure	Afound			_(km)
Total Deck Length	(m)	Fill on Structur	re	2.	.4	_(m)
Overall Str. Width	(m)	Skew Angle		2	1	_(Degrees)
Total Deck Area	82.2 (m ²)	Direction of St	ructure	N-	-S	_
Roadway Width	(m)	No. of Spans		1	l	_(m)
Span Lengths	(m)					
HISTORICAL DATA						
Year Built	1970 (est)	_ Last Bi	ennial Inspection	ı	Au	gust 7, 2020
Current Load Limit		_(tonnes) Last Br	ridge Master Insp	ection		
Load Limit By-Law#		_	/aluation			
By-Law Expiry Date Min. Vertical Clearance		-	nderwater Inspect	tion		
Milli. Vertical Clearance		_(m) Last Co	ondition Survey			
Rehabilitation History	y: (Date / Description)					

CULVERT Site No.: 04

FIELD INSPECTION	INFORMATION
Date of Inspection:	June 03, 2022
Inspector:	Tashi Dwivedi, P.Eng., HP Engineering
Others in Party:	Nicholas Brown, HP Engineering
Equipment Used:	Digital camera, measuring tape, hammer
Weather:	Sunny
Temperature:	20 °C
Temperature:	

ADDITIONAL INVESTIGATION REQUIRED		Estimated		
ADDITIONAL INVESTIGATION REQUIRED	None	Normal	Urgent	Cost
Detailed Deck Condition Survey:	X			\$
Bridge Rehabilitation / Replacement Study:		X		\$ 20,000.00
Detailed Coating Condition Survey:	X			\$
Underwater Investigation:	X			\$
Fatigue Investigation:	X			\$
Seismic Investigation:	X			\$
Structural Evaluation:	X			\$
Load Posting - Estimated Load			Total Cost	\$ 20,000.00

Special Notes:

Rehabilitation / replacement study is for culvert barrier and barrel.

Low barrier with 4 buried ends does not conform to current standards and should be replaced.

Moderate to severe corrosion and perforations at water level; it is recommended the structure be replaced in 1-5 years. Deformation at south end of barrel. Separation of plates noted along most of the west side of pipe. It is recommended to monitor the barrel movement.

Next Detailed Inspection:	June 2024

Sus	pected Performance Deficiencies				
00	None	06	Bearing not uniformly loaded/unstable	12	Slippery surfaces
01	Load carrying capacity	07	Jammed expansion joint	13	Flooding/channel blockage
02	Excessive deformations (deflections & rotation)	08	Pedestrian/vehicular hazard	14	Undermining of foundation
03	Continuing settlement	09	Rough riding surface	15	Unstable embankments
04	Continuing movements	10	Surface ponding	16	Other
05	Seized bearings	11	Deck drainage		
Mai 01 02 03 04 05	ntenance Needs Lift and swing bridge maintenance Bridge cleaning Bridge handrail maintenance Painting steel bridge structures Bridge deck joint repair	07 08 09 10	Repair of structural steel Repair of bridge concrete Repair of bridge timber Bailey bridges maintenance Animal/pest control	13 14 15 16 17	Erosion control at bridges Concrete sealing Rout and seal Bridge deck drainage Other
06	Bridge bearing maintenance	12	Bridge surface repair		

ELEMENT DATA	1								
Element Group:	Approach			Length	1:	35 m			
Element Name:	Barrier			Width:	:	-			
Location:	North & South of S	Structure		Height:	:	-			
Material:	Steel			Count:		2			
Element Type:	Steel Beam Guidera	ail on Wood Posts		Total (Quantity:	70 m	l .		
Environment:	Moderate			Not Ins	spected:				
Protection System	Hot-Dip Galvanize	d					Performance	Maintenance	
Units	Excellent	Good	Fair		Poor		Deficiencies	Needs	
m	-	59	10		1		08	-	
		some checks and rot. Ste				act with	h an area of localized r	ust. Low barrier	
None	- 4 buried siles s	1 − 5 years □	Illiando ana s	1 y			Urgent		
Element Group:	Approaches			Length	 1:	30 m			
Element Name:	Wearing Surface			Width:		7.8 m	<u> </u>		
Location:	East & West of Stru	ucture			Height: -		-		
Material:	Gravel			Count:		2			
Element Type:	Wearing Surface			Total (Quantity:	468 r	m²		
Environment:	Severe			Not Ins	spected:				
Protection System	None						Performance	Maintenance	
Units	Excellent	Good	Fair		Poor		Deficiencies	Needs	
m²	-	468	-		-		-	-	
Comments: Gen-	erally in good conditi	ion with some loose grave	el and localized	washout c	on north side. Grav	el accu	ımulation noted at side	of the road.	
None •		1 − 5 years		< 1 y	year 🗌		Urgent □		
					, c		0 _		
Element Group:	Culvert			Length		<u>-</u>			
Element Group:	Inlet Components			Width:		-			
Location:	South of Structure			Height:		-			
Material:	Concrete			Count:		4			
Element Type:	Cast-in-Place Conc	erete			Quantity:	4			
Environment:	Moderate Moderate	<u>rete</u>			spected:	•			
Protection System	None			1101 2					
Units	Excellent	Good	Fair		Poor		Performance Deficiencies	Maintenance Needs	
m ²	-	4					_	_	
	visible at time of inst	pection. Beaver dam obstr	ructing flow thro	ough barr	el at inlet.				
None		$1-5$ years \Box		< 1 y	year		Urgent		

Element Group:	Culvert			Length	1:	-			
Element Name:	Outlet Components	3		Width:		-			
Location:	North of Structure			Height	:	-			
Material:	Concrete			Count:		-			
Element Type:	Cast-in-Place Cond	rete		Total (Quantity:	4 m ²			
Environment:	Moderate			Not Ins	spected:				
Protection System	None						Performance	Maintenance	
Units	Excellent	Good	Fair		Poor		Deficiencies	Needs	
m^2	-	4	-		•		-	-	
Comments: Vis	ible portion is in good	condition with moderate	e scaling. Moss g	rown at c	outlet of the culver	t barrel			
None		1 − 5 years		< 1	year		Urgent		
Element Group:	Culvert			Length	ı:	27.4	m		
Element Name:	Barrel			Width:	:	3 m			
Location:	Below Roadway			Height	:	3 m	3 m		
Material:	Corrugated Steel			Count: 1		1			
Element Type:	Structural Plate CS	P		Total Quantity: 2:		258.2	24 m ²		
Environment:	Benign			Not Inspected:					
Protection System	Hot-Dip Galvanize	d					Performance	Maintenance	
Units	Excellent	Good	Fair		Poor		Deficiencies	Needs	
m ²	-	-	129.123	3	129.12		01	-	
end		sion and perforations at w noted at south end of bar nent.							
None		1 − 5 years		< 1	year 🔲		Urgent □		
Element Group:	Foundations			Length	:	-			
Element Name:	Foundations (below	v ground level)		Width:	;	-			
Location:	Below Structure			Height	:	-			
Material:	Unknown			Count:		-			
Element Type:	Unknown			Total (Quantity:	-			
Environment:	Benign			Not Ins	spected:				
Protection System	Unknown						Performance	Maintenance	
Units	Excellent	Good	Fair		Poor		Deficiencies	Needs	
N/A	-	-	-		-		-	-	
Comments: No	evidence of foundation	n instability/ settlement r	noted at the time	of inspec	tion.				

Element Group:	Embankment and Streams				:	-		
Element Name:	Embankments V					-		
Location:	NE, NW, SE, & SV	NE, NW, SE, & SW of Structure				-		
Material:	Native	ative				4		
Element Type:	Embankment			Total (Quantity:	4		
Environment:	Benign			Not Ins	spected:			
Protection System	None						Performance	Maintenance
Units	Excellent	Good	Fair		Poor		Deficiencies	Needs
each	-	4	-		-		-	-
Comments: Em	bankments noted stee	ply sloped, heavily vegeta	ated and appear s	table at tl	he time of inspecti	on.		
None		1 – 5 years □		< 1 y	year □		Urgent	
Element Group:	Embankment and S	Streams		Length	:	-		
Element Name:	Streams and Water	ways		Width:		-		
Location:	Under Structure			Height	:	-		
Material:	Native			Count:		-		
Element Type:	Stream			Total (Quantity:	-		
Environment:	Benign			Not Ins	spected:			
Protection System	None						Performance	Maintenance
Units	Excellent	Good	Fair		Poor		Deficiencies	Needs
all	-	-	all		-		00	00
Comments: Mo	derate volume and hig	gh flow from south to nor	th through barrel	. High vo	olume upstream of	structe	ed by large beaver dam	downstream.
None □								

REPAIR AND REHABILIT	ATION REQUIRED		Estimated		
Element	Repair and Rehabilitation Required	6 - 10 Years	1 - 5 Years	< 1 year	Cost
Barrier	Replace substandard end treatments with code compliant end treatments			X	\$ -
Culvert	Replace Barrel		X		\$ 282,000.00
					\$ -
					\$ -
					\$ -
					\$ -
					\$ -
					\$ -
					\$ -
		1	1	Total Cost	\$ 282,000.00

ASSOCIATED WORK	Comments]	Estimated Cost	
Approaches				
Detours		\$	100,000.00	
Traffic Control		\$	60,000.00	
Utilities				
Right of Way				
Environmental Study		\$	10,000.00	
Other				
Contingencies				
	Total Cost	\$	170,000.00	

JUSTIFICATION	



Photo 1 Structure from east approach



Photo 2 Structure from west approach



Photo 3 East approach from centre of structure



Photo 4 West approach from centre of structure



Photo 5 North elevation



Photo 6 South Elevation